REMARKS

Claims 1-25 are pending in the above-referenced application. With this Amendment, Claims 1, 9, 12 and 18are being amended, and Claims 8, 23 and 24 are being canceled, without prejudice against their reintroduction into this or one or more timely filed continuation, divisional or continuation-in-part applications. Thus, after entry of this Amendment, Claims 1-7, 9-22 and 25 are pending and under consideration. The amendments of the claims and the various rejections of Claims 1-25 in the Office Action are discussed in more detail, below. Specifically, in accordance with the item numbering therein, the Office Action has:

In Items 3-4 rejected claims 1-25 under 35 USC 102(e) as being anticipated by Bratt (US Patent No. 6,877,020).

In Items 5-21, rejected claims 1-17, respectively, all based on the teachings of Bratt; and

In Items 22-29, rejected claims 18-25, respectively, wherein the rejection of claim 18 is based on the rejection of claim 1, the rejection of claim 19 is based on the rejection of claim 1, the rejection of claim 20 is based on the rejection of claim 7, the rejection of claim 21 is based on the rejection of claim 16, the rejection of claim 22 is based on the rejection of claim 17, the rejection of claim 23 is based on the rejection of claim 1, and the rejection of claim 25 is based on the rejection of claim 11.

Applicants point out in their response that claims 1, 12, and 18 are the independent claims.

Regarding Item 5 in which claim 1 is rejected, Applicants respectfully submit that the Bratt reference fails to teach all of the limitations of claim 1. The Office Action has cited Bratt Cols. 50, 51 and 52 and FIGs. 75 and 76 in support of the rejection. In those portions of the reference Bratt describes a matrix transposition. However, the transposition in Bratt is not accomplished in the same way as the transposition in the present invention. FIG. 75 of Bratt shows the operations for transposing a matrix, which include operations 9511, 9513, and 9515. In operation 9511, the rows of the matrix are rotated, depending on their position in the matrix. For example, row vb6 9503 is rotated 6

positions. Bratt, Col. 50, lines 61-62. Next, in operation 9513, the columns of the matrix 9532 are rotated. Bratt, Col. 50, lines 62-65. Finally, in operation 9515, the rows of matrix 9533 are rotated to arrive at the transposed matrix. The flow chart in FIG. 77 of Bratt describes these steps.

Applicants respectfully submit that the present invention does not perform the transpose of the matrix in the same way. Specifically, the invention in Bratt does not have an output rotator and controller that operate in the same way as in Applicants invention. In Applicants' invention the output rotator reads a rotated row of vectors and performs a single rotation, depending on the time slot of the vector, to arrive at a time parallel output vector. Applicants have recited in claim 1 "an output rotator coupled to the bank of registers files, for receiving and rotating the components of a vector an amount that depends on the time slot of the vector to generate a vector having the time parallel format." The output rotator is described in Applicants specification at least in paragraph 0022 of Applicants specification. There an example is given where, in cycle 6, a vector in slots 1.0, 2.1, 3.2 and 0.3 is read, which yields, in the example, W1, X1, Y1, Z1 and then rotated to yield, X1, Y1, Z1 and W1, which is a vector in time parallel format. It is important to note here that the slots read in the register file are 1.0, 2.1, 3.2 and 0.3. These slots have no further alterations to them before they are read, contrary to the operations in the Bratt reference. In Applicants' invention in the next write operation (a vertical write), the input rotator writes these slots 1.0, 2.1, 3.2, and 0.3 with the new components, Y5, Y6, Y7, and Y4, respectively. No such operation occurs in the Bratt reference. Applicants also recite in claim 1, "a controller configured to control alternating horizontal reading and writing and vertical reading and writing operations upon the bank of register files," to make this difference clear.

Therefore, Applicants submit that all of the limitations of the Bratt reference are not taught in the present invention, as recited in claim 1. Applicants have amended claim 12 to recite "wherein writing each set of corresponding components and reading the vector components is performed either horizontally or vertically, in an alternating fashion," to make the difference between Bratt and the present invention clear. Applicants have also amended claim 18 to recite "controller means, communicably coupled to the input rotator means, the storage means and the output rotator means, for

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controlling the writing and reading of the vector components to the storage means and the rotation of the vector components by the output rotation means and the input rotation means, and for controlling said reading and writing operations horizontally and vertically, said horizontal operations alternating with said vertical operations," so that the same argument as submitted in claim 1 applies.

The Office Action has alleged, in regard to claim 8, that the Bratt reference teaches the horizontal and vertical operations and the alternating of those operations, citing Col. 51 of the Bratt reference and the 9513 operation. Applicants respectfully submit that the 9513 operation is not a horizontal or vertical operation, as those terms are defined and used in the present invention. Operation 9513 in FIG. 75 is an operation in which the column of the matrix is altered by means of a specific rotation. In the FIG. 7, column 9504, which has elements $[a05, a14, a23, a32, a41, a50, a67, a76]^T$, is rotated to produce $[a50, a41, a32, a23, a14, a05, a76\ a67]^T$. This is not the vertical operation of the present invention. In the vertical operation of the present invention, matrix 9532 would be read to obtain $[a35, a45, a55, a65, a75, a05, a15, a25]$, for example. This read, followed by a five step counter clockwise rotation would directly produce the time parallel vector $[a05, a15, a25, a35, a45, a55, a65, a75]$. In the Bratt reference, after the column rotation, another row rotation must be performed before the time parallel vectors are available. This is inefficient compared to Applicants' invention, which requires only one rotation. Therefore, the operations in the Bratt reference are not the operations being recited in claims 1, 12 and 18. Therefore, Applicants respectfully suggest that claim 1, 12 and 18 are not anticipated by the Bratt reference.

Regarding claim 2, Applicants submit that claim 2 is allowable at least because claim 1, from which it depends is allowable.

Regarding claim 3, Applicants submit that claim 3 is allowable at least because claim 1, from which it depends is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein the amount of rotation by the output rotator is zero for the 0th vector and n-1 steps counter-clockwise for the $(n$-1)th vector, any intervening vectors being rotated by an amount equal to the ordinal number of the vector," because the Bratt reference fails to describe the output rotator of the present

invention. Bratt performs a two step operation to provide a time parallel output vector. One of these steps alters the columns of the matrix. Applicants invention has no such two step operation.

Regarding claim 4, Applicants submit that claim 4 is allowable at least because claim 1, from which it depends is allowable.

Regarding claim 5, Applicants submit that claim 5 is allowable at least because claim 4, from which it depends is allowable.

Regarding claim 6, Applicants submit that claim 6 is allowable at least because claim 5, from which it depends is allowable.

Regarding claim 7, Applicants submit that claim 7 is allowable at least because claim 1, from which it depends is allowable.

Regarding claim 9, Applicants submit that claim 1 is allowable at least because claim 1, from which it depends is allowable. Additionally, Applicants submit that claim 9 fails to teach the limitation "wherein the vector has n components and the controller horizontally writes n sets of corresponding components and horizontally reads n vectors," because the Bratt reference fails to teach the use of alternating horizontal and vertical operations.

Regarding claim 10, Applicants submit that claim 10 is allowable at least because claim 9, from which it depends is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein, after the controller horizontally writes n sets of corresponding components and horizontally reads n vectors, the controller vertically writes n sets of corresponding components and vertically reads n vectors," again because the reference fails to teach the use of horizontal and vertical operations on the storage bank.

Regarding claim 11, Applicants submit that claim 11 is allowable at least because claim 1, from which it depends, is allowable. Additionally, the reference fails to teach the limitation "wherein the output rotator rotates the vector component a position equal and opposite to the input rotator," because the Bratt reference fails to teach the presence and operation of the output rotator and therefore, how the output rotator works in relation to

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the input rotator.

Regarding claim 13, Applicants submit that claim 13 is allowable at least because claim 12, from which it depends, is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein if the vector components are written horizontally to the bank of register files, then the vector components are read horizontally from the bank of register files," because the Bratt reference does not teach the horizontal operation of the present invention.

Regarding claim 14, Applicants submit that claim 14 is allowable at least because claim 12, from which it depends, is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein if the vector components are written vertically to the bank of register files, then the vector components are read vertically from the bank of register files," because the Bratt reference fails to teach the vertical operation of the present invention.

Regarding claim 15, Applicants submit that claim 15 is allowable at least because claim 12, from which it depends, is allowable.

Regarding claim 16, Applicants submit that claim 16 is allowable at least because claim 12, from which it depends, is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein n sets of corresponding components are horizontally written over n clock cycles and vectors are horizontally read over the same n clock cycles," again because the Bratt reference fails to teach the horizontal reading and writing as in the present invention.

Regarding claim 17, Applicants submit that claim 16 is allowable at least because claim 16, from which it depends, is allowable. Additionally, Applicants submit that the Bratt reference fails to teach the limitation "wherein in another n clock cycles subsequent to the n clock cycles, n sets of corresponding components are vertically written over n clock cycles and vectors are vertically read over the same n clock cycles," again because the Bratt reference fails to teach the vertical reading and writing of the present invention.

Regarding claim 18, the argument with respect to claim 1 applies.

Regarding claim 19, the argument with respect to claim 1 applies.

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Regarding claim 20, the argument with respect to claim 7 applies.

Regarding claim 21, the argument with respect to claim 16 applies.

Regarding claim 22, the argument with respect to claim 17 applies.

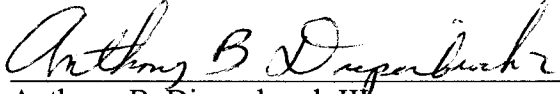Regarding claim 25, the argument with respect to claim 11 applies.

CONCLUSION

Having addressed each and every rejection, Applicants believe that Claims 1-7, 9-22 and 25 are believed to satisfy all of the criteria for patentability and in condition for allowance, which is respectfully requested.

No fees beyond the two month extension of time are believed to be due in connection with this Amendment. However, the Director is authorized to charge any additional fees that may required, or credit any overpayment, to Dechert LLP Deposit Account No. 50-2778 **(Order No. 372465-01001 (336430))**.

Respectfully submitted,

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